

Emerging Contaminants Survey Update

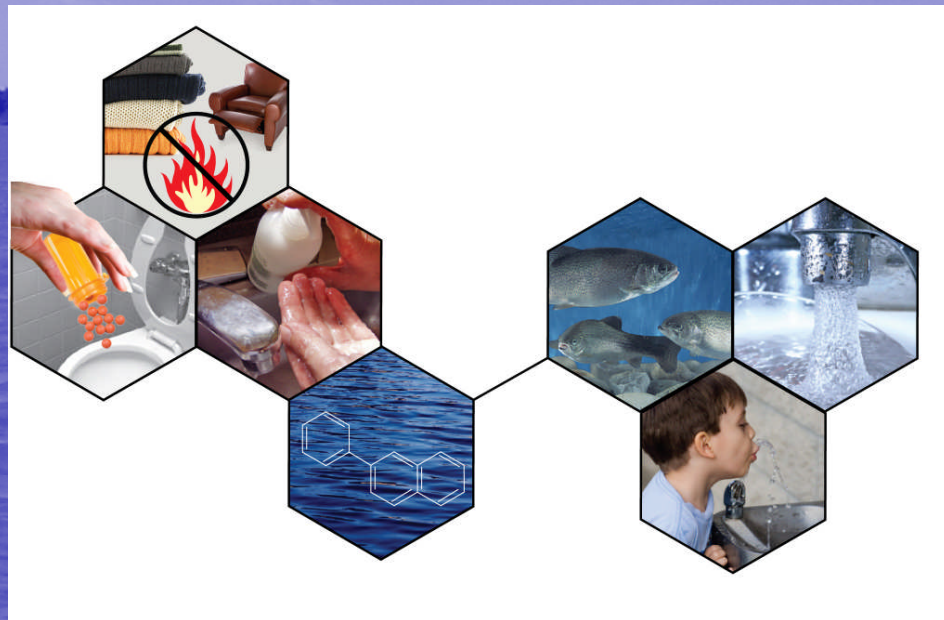
Ambient Toxicity Workgroup

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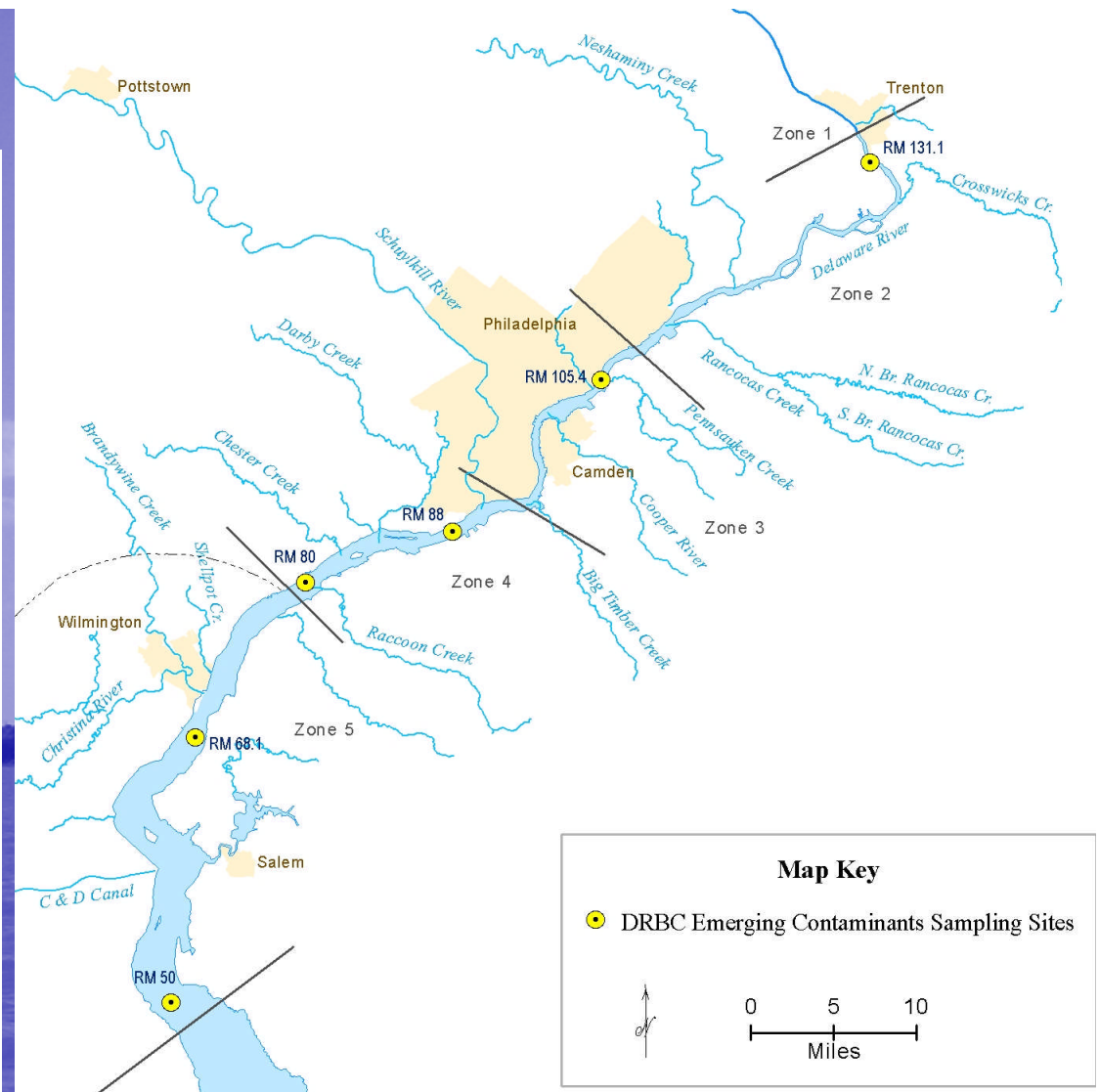
DRBC

April 29, 2010

- Programs: DRBC Criteria and Aquatic Life
- Goals: collect ambient water data for contaminants of emerging concern
- Participants: DRBC, AXYS

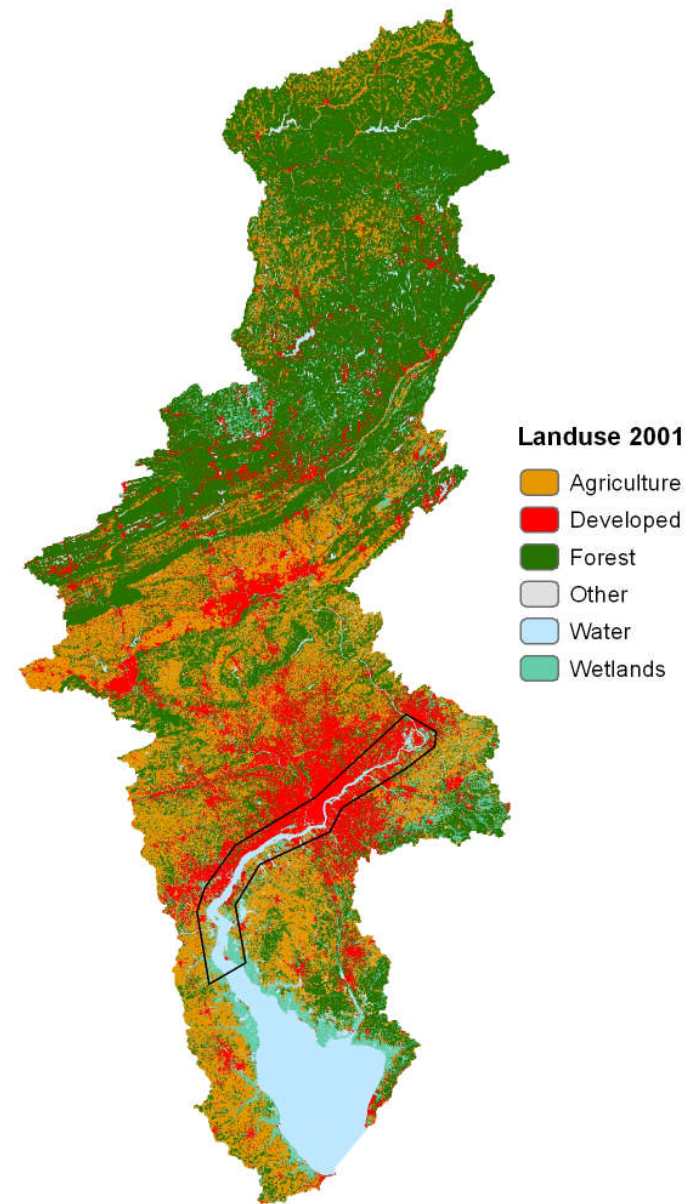


Delaware River Basin



Ambient Water Sampling

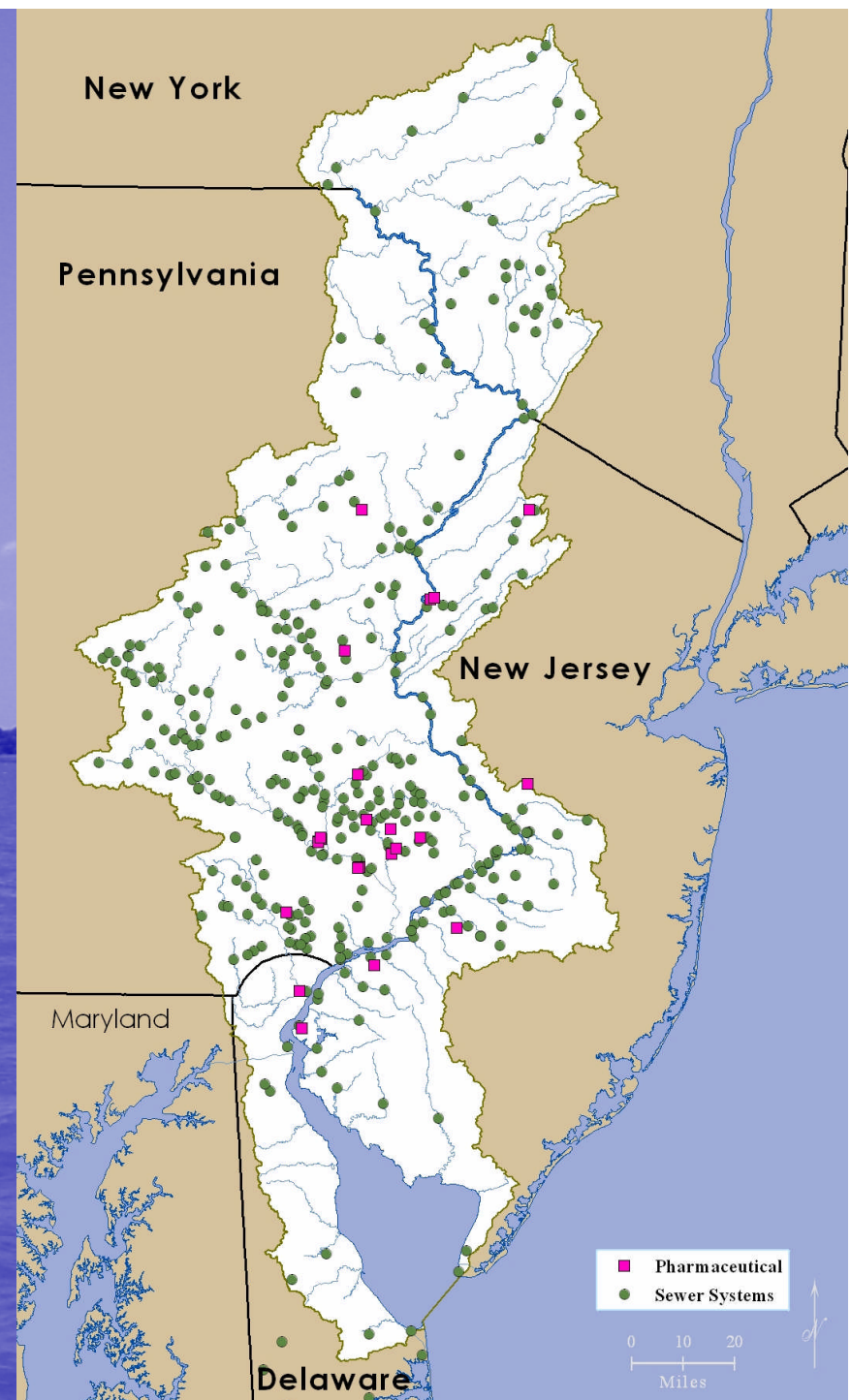
- Map of Delaware River Basin Landuse
 - from USGS National Land Cover Database
 - EC survey was conducted in the tidal Delaware River (outlined in black)
 - urbanized and industrialized area
 - Over 6 million residents live in contributing watersheds



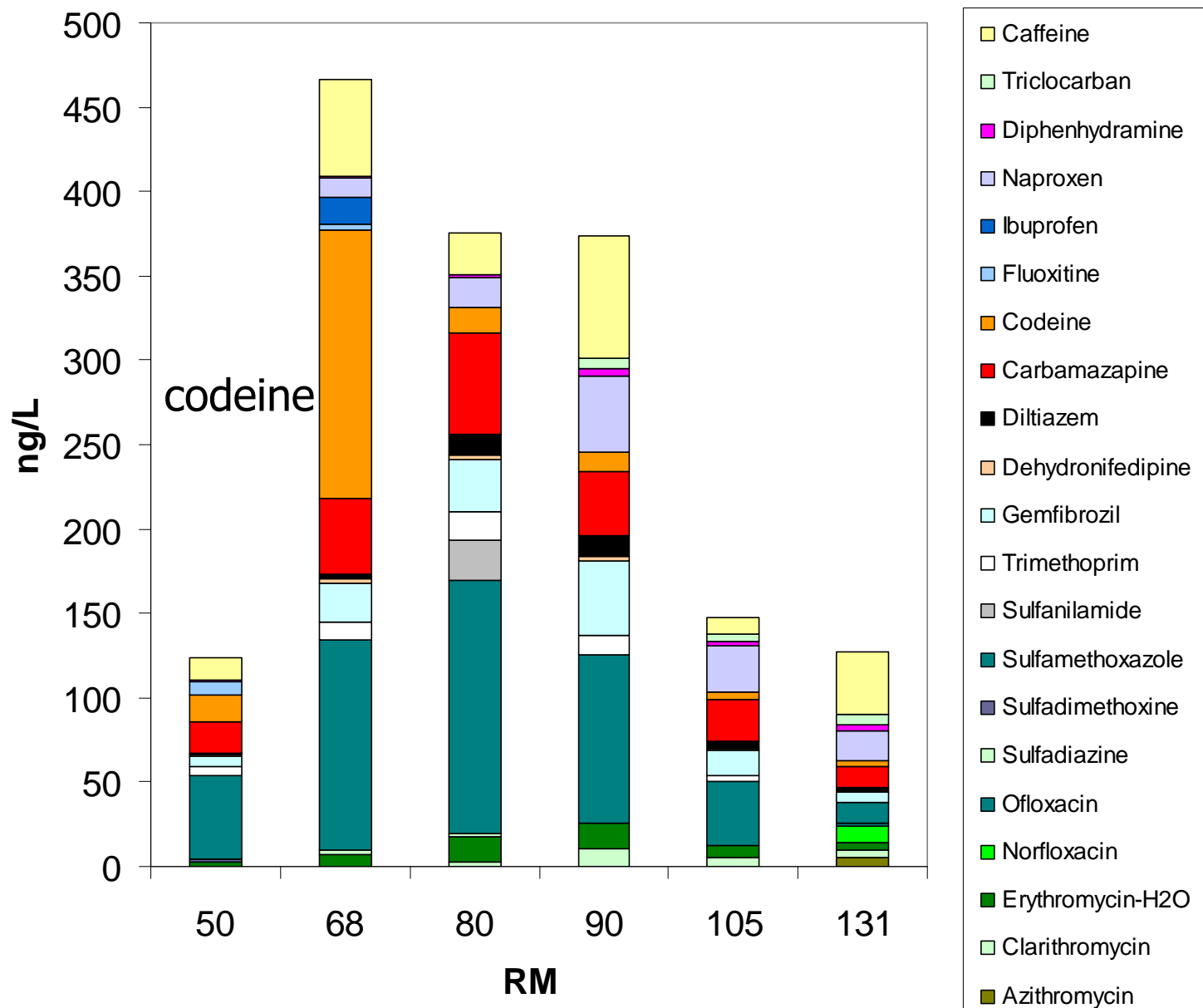
Emerging Contaminants Ambient Water Surveys Delaware Estuary (rev 05/07/10)

	2007 # of analytes / # detected	2008 # of analytes / # detected	2009 # of analytes / # detected
PFC LC/MS/MS	13/11	13/11	13/11
PPCP LC/MS/MS	54/21	72/24	119/46
Hormones GC/LRMS	24/6	27/11	17/3
NP and NPE GC/MS	3/2	3/1	3/2
bis-phenol-A LC/MS/MS		1/0	1/0

Pharmaceutical Source Map for the Delaware River Basin



PPCP in Tidal Delaware River



2007
Survey

OTC

prescription

antibiotics

- Aquatic ecotoxicity data, primarily based on individual compounds and single species tests, is readily available for some but not all PPCP analytes limiting assessment of risk to aquatic life.

- Risk Index = $MEC/PNEC$

MEC = measured environmental concentration

PNEC = predicted no effect concentration

- First Tier screening for prioritization of future assessment and characterization

2009 POTW SURVEY

- 0.57 MGD POTW - 1^o clarifier, rotating biological contactor, 2^o clarifier, chlorination
 - PPCP (MLS-075)
- 134 MGD POTW – 1^o settling, activated sludge, 2^o settling, polishing ponds, chlorination
 - Residence time/ detention time: 4 days at 80 MGD average
 - PPCP (MLS-075)
 - Bisphenol A (MLA-059)
 - hormones (MLA-072)
 - alkyl phenols (MLA-004)

POTW Survey - Additional Analysis

– 134 MGD POTW effluent

- pre- and post-chlorination analysis - targeting transformation products from disinfection by chlorination of triclosan, triclocarban, nonylphenol, nonylphenol monoethoxylate and nonylphenol diethoxylate, as well as gemfibrozil and carbamazepine
- conjugates of triclosan (MLA-067)

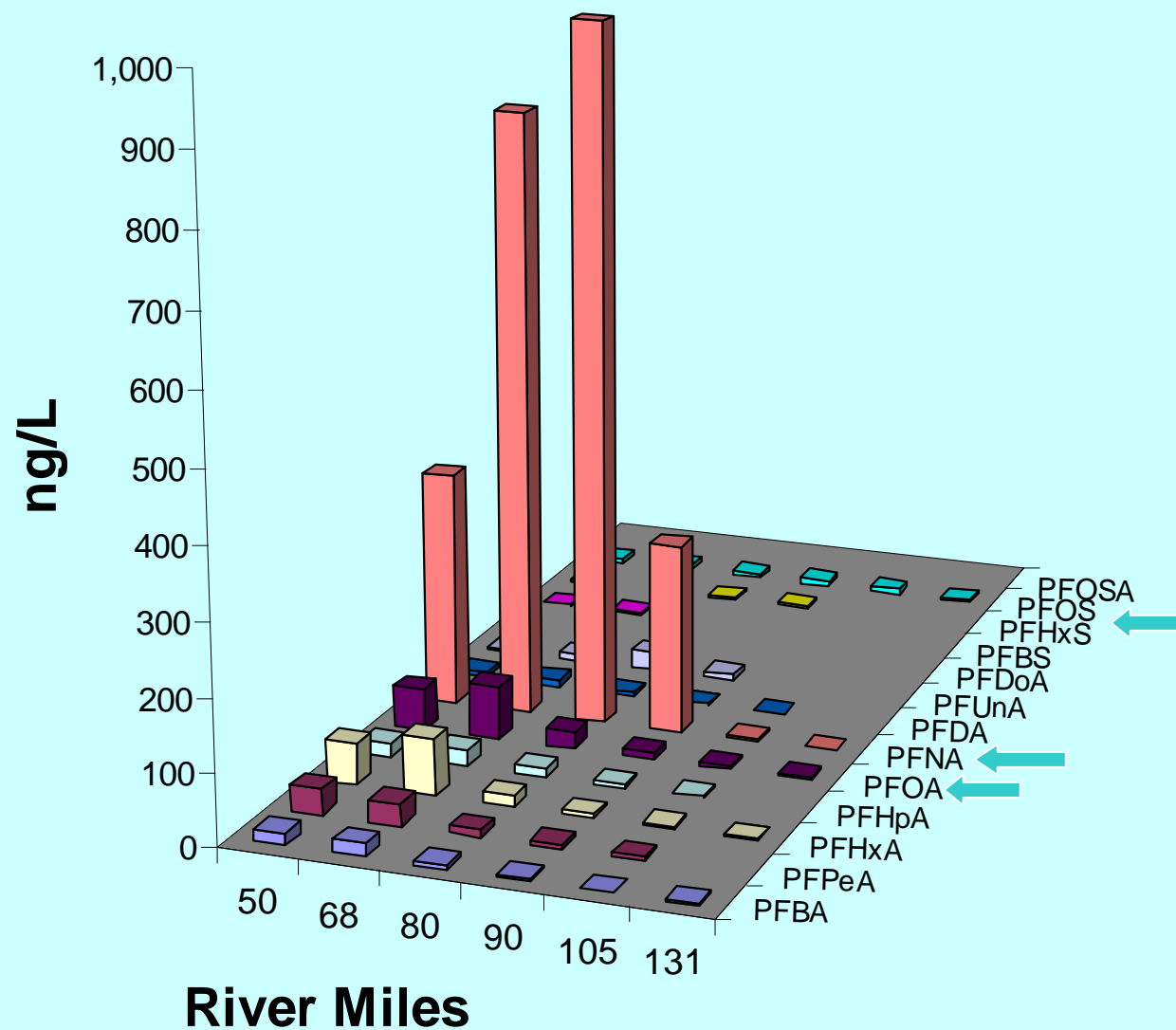
2010

- Ambient EC Survey and POTW Survey
 - Data review for 2007, 2008 and 2009 surveys
 - Report writing

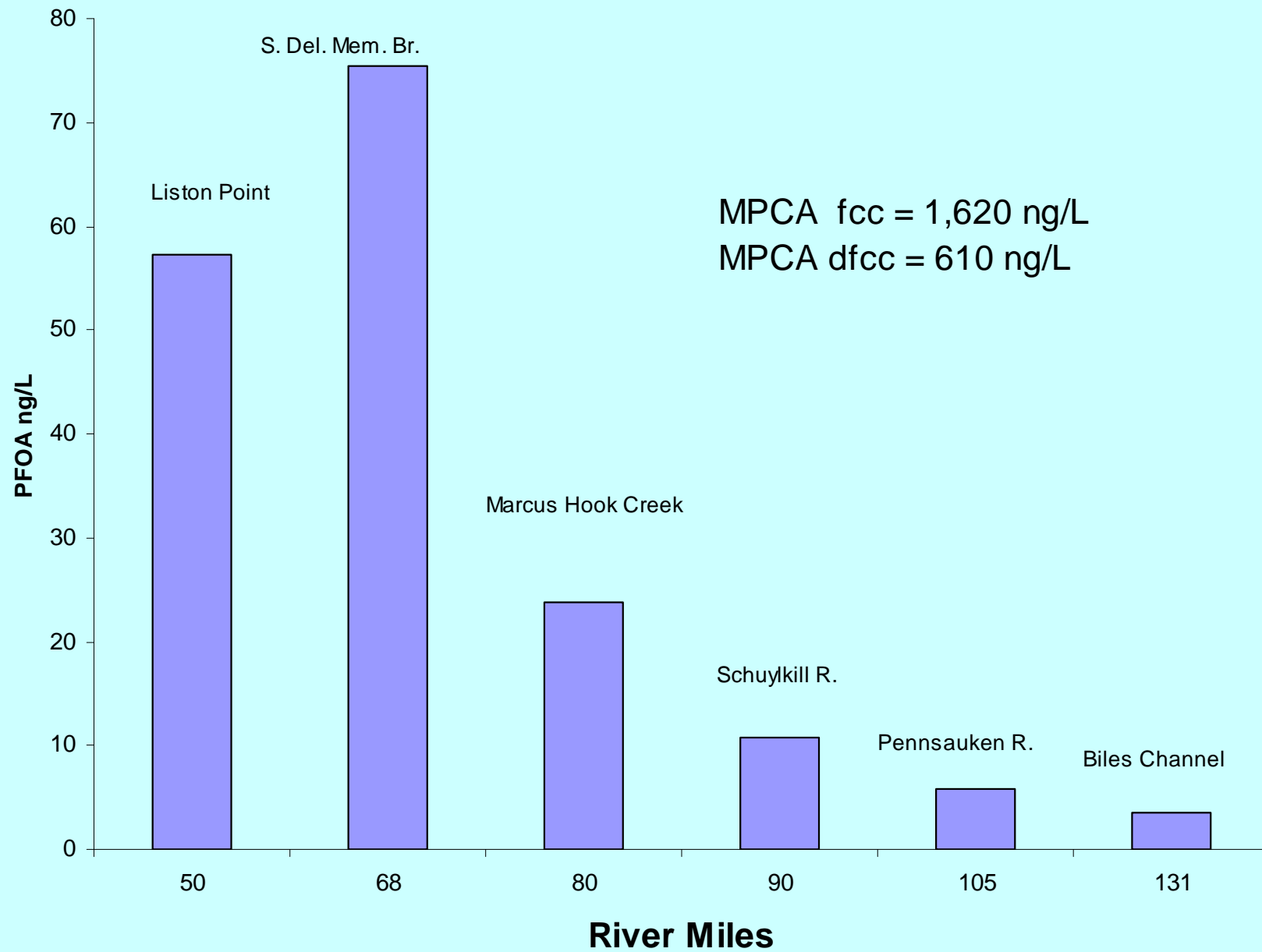
Perfluorochemicals

- Possess unique properties that make them ideal for use in products that resist heat, oil, stains, grease and water.
- Commonly used in nonstick cookware, stain-resistant carpet and fabrics, fire-fighting foam and other industrial applications.
- Their chemical structure make them extremely resistant to degradation in the environment.

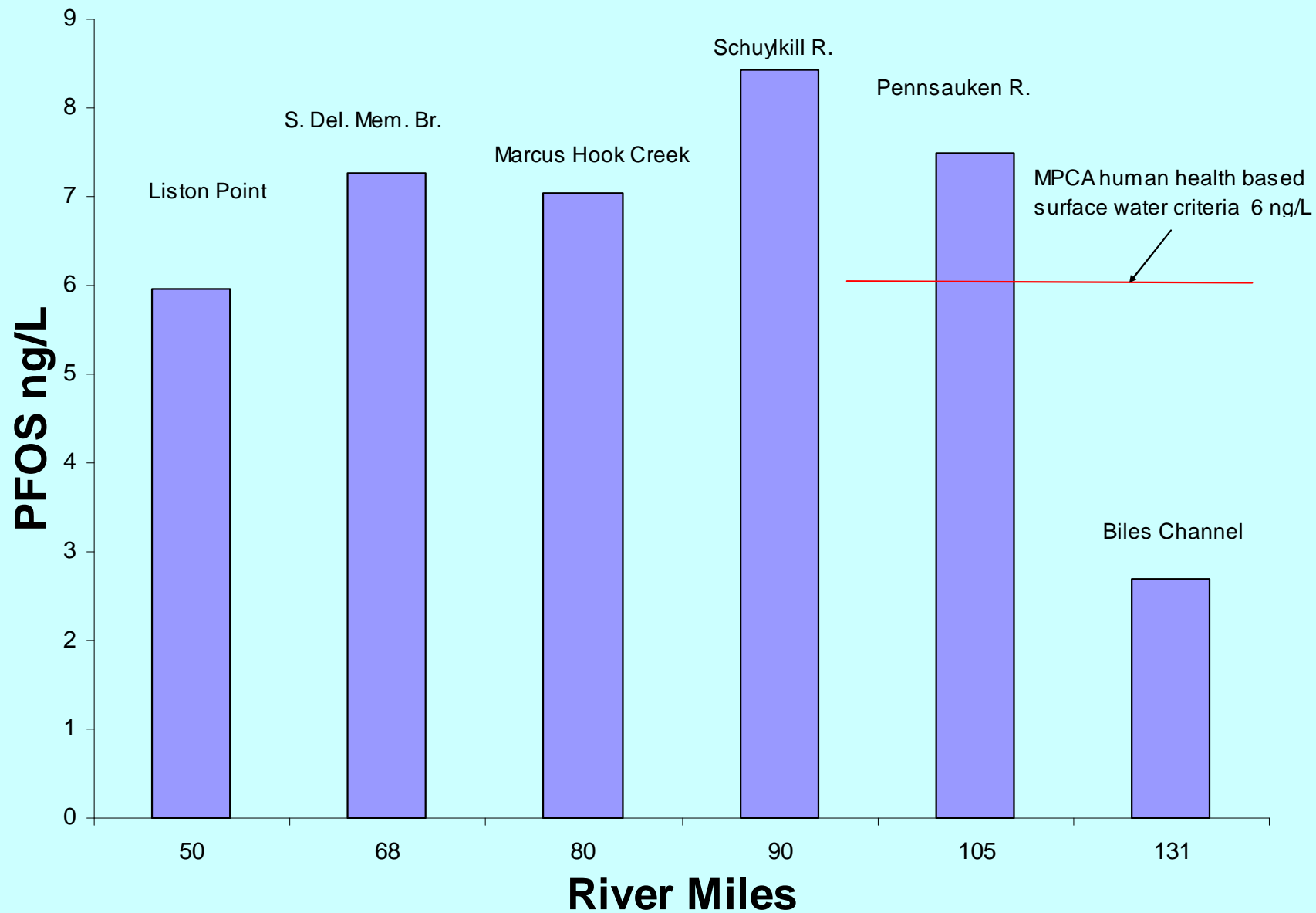
PFC In Ambient Waters Of TheTidal Delaware River



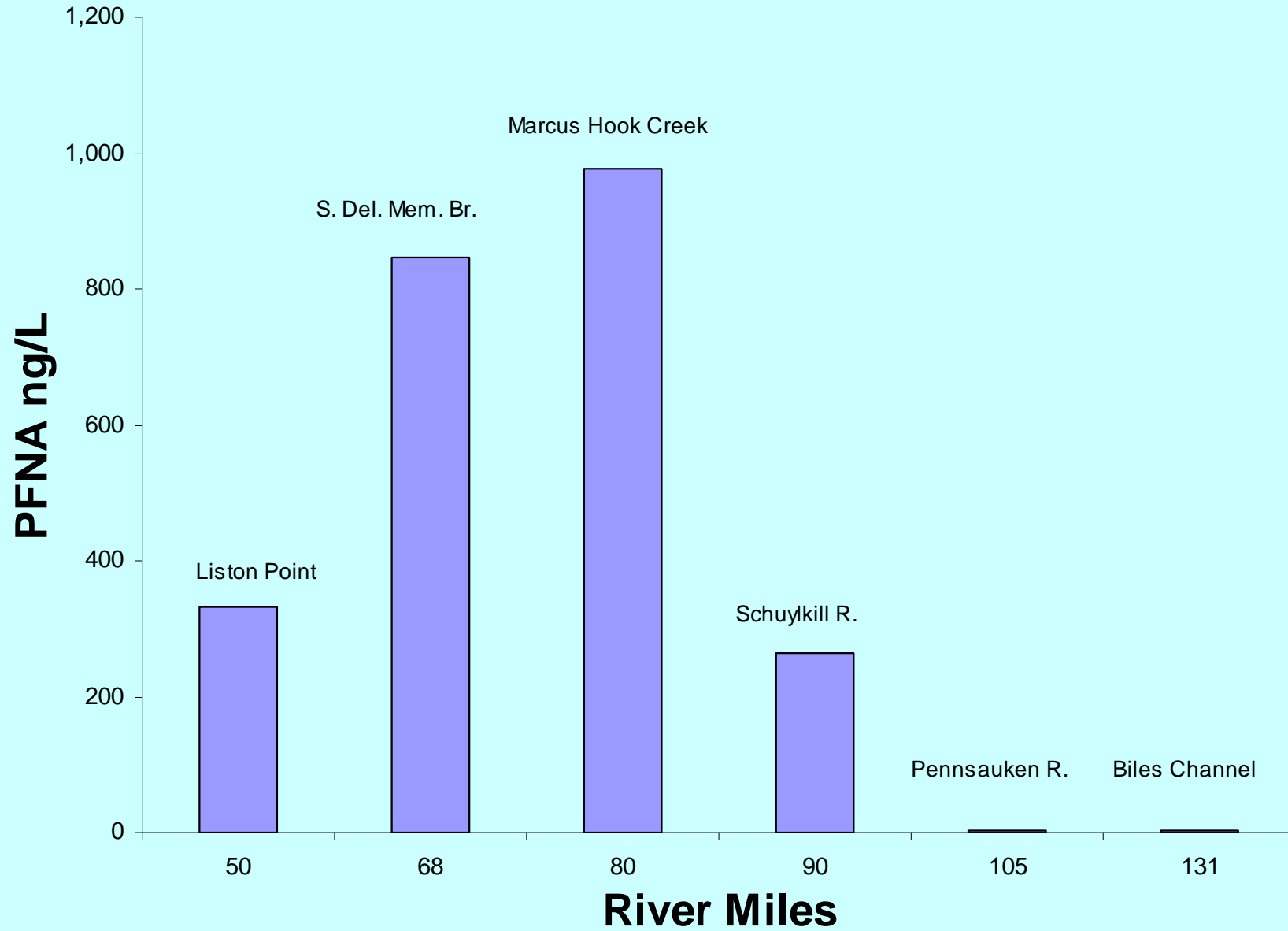
PFOA In Ambient Water Of TheTidal Delaware River



PFOS In Ambient Waters Of TheTidal Delaware River



PFNA In Ambient Waters Of The Tidal Delaware River



2010

- Proposed PFC survey within DRBC Zones 3, 4 and 5 – emphasis on C9
- PFC survey in Schuylkill River
- PFC survey in other targeted tribs